

IMAGINATIVE PLAY PREDISPOSITION, PLAYFULNESS,  
IDEATIONAL FLUENCY: THEIR RELATIONSHIPS  
IN KINDERGARTEN AND FIRST GRADE CHILDREN

BY  
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Abstract of Dissertation Presented to the Graduate Council  
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Children's play behavior has been the focus of numerous experimental studies and theoretical conceptualizations. As a body of literature, however, it is markedly diverse and without agreement as to what play behavior is or its significance. This study examined three constructs: playfulness, imaginative play predisposition and ideational fluency which have theoretically encompassed both the affective and cognitive functions of play behavior. This was done in an effort to provide a more unified theoretical conceptualization as well as an experimental data base for developmental aspects of play behavior. In addition, an extensive literature review of the theoretical literature on play behavior was provided.

Seventy-nine kindergarten and first-grade white children from five socioeconomic status backgrounds were studied in a semi-urban school. All children were of at least normal intelligence and participating in the regular school

program. Playfulness, a multidimensional construct, was examined utilizing a teacher rating scale developed by Lieberman. This construct hypothesizes five qualitative and quantitative dimensions of playfulness: physical spontaneity, social spontaneity, humor, manifest joy, and cognitive spontaneity. Imaginative play predisposition, the ability to interject an "as if" quality into play, was measured utilizing Singer's interview technique as well as the Holtzman Inkblot Test. Two different scoring techniques were utilized for the Holtzman Inkblot Test in an effort to further clarify the methodology necessary to measure imaginative play predisposition in a younger population. Ideational fluency was measured utilizing Lieberman's modification of Torrance's work. It was hypothesized that these three constructs could be measured and replicated on a sample of kindergarten and first grade children from heterogeneous socioeconomic status backgrounds in a semi-urban school. It was further hypothesized that there would be positive interrelationships between these behaviors, as measured, providing the beginning of the data base necessary for a more unitary theoretical conceptualization of play.

Imaginative play predisposition was replicated on this population with approximately 50% of the subjects demonstrating high imaginative play predisposition and 50% demonstrating low imaginative play predisposition. There were

continued difficulties with the Holtzman Inkblot Test, as an appropriate methodology for a younger population. The evidence for ideational fluency was replicated on this population. The Playfulness Scale proved problematical in that the reliability of the data is somewhat questionable. Significant relationships were found between imaginative play predisposition and cognitive spontaneity. The relationship between imaginative play predisposition as measured by the Singer interview plus the Holtzman movement score and the quantitative index for cognitive spontaneity as measured by the Lieberman rating scale was significant at the .005 level. Imaginative play predisposition as measured by the Singer interview plus the Holtzman movement score and the qualitative index for cognitive spontaneity as measured by the Lieberman rating scale was significant at the .05 level. Imaginative play predisposition as measured by the Singer interview plus the Holtzman movement plus human response and the quantitative index for cognitive spontaneity as measured by the Lieberman rating scale was related at the .005 level of significance. Discussion provides clarification of results, new methodological considerations, as well as new directions for future research.

CHAPTER I  
INTRODUCTION AND HISTORICAL  
PERSPECTIVE ON THEORIES OF PLAY

Children's play has captured the interest of philosophers, psychologists, anthropologists and sociologists. As Plato is paraphrased by Erikson, the model of true playfulness is

in the need of all young creatures, animal and human, to leap. To truly leap, you must learn how to use the ground as a springboard and how to land resiliently and safely. It means to test the leeway allowed by given limits; to outdo and yet not escape gravity. Thus, wherever playfulness prevails there is always a surprising element, surpassing mere repetition or habituation and at its best suggesting some virgin chance conquered. (Erikson, 1977, p. 17)

Despite a longstanding interest, a variety of theoretical conceptualizations and numerous studies, there is little agreement as to what play is, or the significance of this behavior. Weisler and McCall (1976) note that there is an inflationary trend in the number of articles produced each year but a recession in the real production of knowledge in that area. They suggest that part of the difficulty lies in the lack of a precise definition of play and the lack of a comprehensive theory of play. This paper will first provide a historical perspective on the various trends in play theory. Then two recent conceptualizations of play behavior,

Singer's (1968) construct of imaginative play and Lieberman's (1964) construct of playfulness will be discussed in light of their usefulness for providing unity in the area.

A brief look at various theoretical perspectives of play is necessary at this point to provide a fuller perspective on psychological thinking regarding play behavior. There have been numerous conceptualizations of play. Gilmore (1966) divides these theories into two categories. The classical theories, which are concerned with the antecedents and purposes of play and not its content, comprise the first group. The more recent theories concerned with the form of play in relation to specifying its cause and effects comprise the second group.

### Classical Theories

Within the classical theories, Gilmore (1966) notes that one of the oldest theoretical statements concerning the significance of play is attributed to both Schiller (1875) and Spencer (1873). This is the surplus energy theory. This theory states that because the young are taken care of by their parents, they have a surplus of energy, as they do not expend energy for self-preservation. This energy surplus is released through the exuberant activities of play. The theory postulates two things: first,

there is a quantity of energy available to the organism; and second, that there is a tendency to expend this energy through play, although it is not necessary for the maintenance of a life balance (Gilmore, 1966). This theory has been put forth by others. Gilmore (1966) notes Terman (1932), Tinklepaugh (1942), and Alexander (1958).

A second classical theory of play is the relaxation theory of play (Gilmore, 1966). Play activity is the product of a deficit of energy, not a surplus. Lazarus (1883) and Patrick (1916) are associated with this theory in which play is seen as the method by which spent energy is replenished (Gilmore, 1966). Gilmore explains that play is a mode for dissipating the inhibition built up from fatigue due to tasks that are new to the organism. It follows then that most play would occur in childhood, as this is a time for acquiring new skills. Play shows very little buildup of inhibition because it reflects deep rooted race habits (psychogenically acquired behaviors that are not new to the organism) (Gilmore, 1966).

Theorists have also seen play as a form of instinctive behavior (Gilmore, 1966). Britt and Janus (1941) and Beach (1945) list approximately two dozen theorists who see play as a form of instinctive behavior. Karl Groos (1898, 1908) is one of these theorists whose theory is known as the pre-exercise theory of play. In this theory play is the product of emerging instincts. Play is the exercising of the

emerging instincts in preparation for their time of maturation.

G. Stanley Hall (1906), a contemporary of Groos, put forward his recapitulation theory of play. In this theory the purpose of play is to rid the organism of unnecessary instinctual skills which are the legacy of heredity. This is in striking contrast to Groos' theory; rather than developing new instinctual skills play is now proposed to eliminate primitive instinctual skills. Hall also postulated stages of play. He was the first to do this, and stated that each child passes through stages corresponding to the cultural stages in the development of races (Gilmore, 1966). Wundt (1913) was also a well-known recapitulation theorist.

An interesting approach to play with an anthropological bent came from Appleton (1910). Having contrasted play in primitive societies and children she suggested that play is a response to a generalized drive for growth in the organism. Rather than instinctual pre-exercise as suggested by Groos, play is the expression of hunger within the organism for growth to the stage at which the instinct could operate. Play, therefore, functions, as a facilitator for skills necessary to the function of adult instincts. Since the child wants mastery and "knows" that play is the method to achieve it, he plays. Gilmore (1966) labels Appleton's theory a growth theory of play.

The early 1900's also produced the ego expanding theories of play. K. Lange (1901) and Claraparede (1911, 1934) are considered to be the first proponents of this perspective (Gilmore, 1966). Ego in these theories equates with the reality mapping aspects of cognitive behavior. Claraparede saw play as an exercising of the ego that strengthened developing cognitive skills and facilitated the emergence of new skills. Lange saw play as the process for ego completion.

#### Recent Theories

The newer theories of play differ from the old in two respects. First is the focus on explanations of play based on dynamics of the individual personality, and the second is the concern with explaining individual changes in play behavior (Gilmore, 1966). Gilmore labels these the infantile dynamics theories. Piagetian and psychoanalytic concepts of play are the best known theories in this category. Lewin (1935) and White (1959, 1964) also fit in this category.

Lewin's position is not extensively elaborated. Play occurs because of the unstructured lifespace of the child. This results in a discrimination failure between what is real and what is unreal. It is easy, therefore, for the child to enter an unreal region where things are changeable and arbitrary.

Piaget's theory of play is more comprehensive. Play is a result of the child's cognitive structure. For Piaget, play is the product of a stage of thinking through which the child must pass in order to develop from an original egocentric viewpoint to the adult's viewpoint (Gilmore, 1966). In order to understand Piaget's conceptualization of play it is necessary to examine the process of cognitive dynamics. Gilmore (1966) explicates this well. Every human behavior within his environment has two discriminable aspects which are central to Piaget's theory. The first aspect is the organism recognizing, categorizing and utilizing events in terms of previous knowledge. He "bends reality" to conform to his habits, conventions and preferences. The second is the individual's response to unique aspects of a new situation which he incorporates to modify or to adjust to this "new reality." These two aspects are always present; one can, however, predominate over the other. Piaget suggests that these two aspects of behavior come from different sources, appear at different times and develop at different rates. It is this dynamic which leads to the appearance of play in children.

Play is that behavior in which the aspect of adjusting reality to fit one's concept of reality predominates. The aspect of accommodating to things as they really are takes a backseat. As this is an aspect of all behavior, all behavior has some play-like aspects. Behaviors are all more

or less playlike, with respect to coping with reality.

Play versus non-play behavior is not a relevant distinction.

Piaget outlines three categories of play: practice play, symbolic play and "games with rules." Practice play is evidenced in the infant as the repetitious performance of any newly acquired ability. This will be performed in a variety of contexts. All new objects the infant encounters are made to fit this pattern regardless of their appropriateness. New learning does not take place. In addition, the infant evidences pleasure with this behavior. Symbolic play has the characteristic of the child symbolizing a behavior in a play. Gilmore (1966) cites the example of a child putting a rag to sleep. The rag, treated as though living, symbolizes to the child that which is salient to him in the concept of sleep. "Games with rules" develop later in life and the name is self-explanatory.

Piaget also draws a parallel between play and dreaming. As in play, concepts in dreams are modified to fit existing emotions, often discounting obvious and logical parameters.

Piaget also examined the development of play in the child. The newborn infant has only limited reflex abilities for processing his world cognitively, more specifically for recognizing and incorporating his experiences or to allow for uniqueness in his experiences. Postulated, however, is a tendency in all organisms to make repeated contact

with a novel event. This tendency "forces" in the infant new knowledge, change in habits and new distinctions regarding his environment. The infant becomes able to act in a play-like manner as he becomes able to act by habit, thereby reducing the number of unique aspects of a given experience. The play potential is a given in the nature of the child and his cognitive structure.

Play behavior is reduced in frequency as a function of the child's experiences. As the child has more experiences, he learns more improved and rational modes of encountering the unfamiliar environment. The child no longer depends on partially appropriate (play-like) responses to new situations. Adult mastery is hallmarked by the individual's reduced need to mold reality to fit his state of the moment.

Gilmore summarizes Piaget's position as follows:

Play is the behavior seen whenever there is a preponderance of that aspect of all behavior that involves taking in, molding, and using things, all in terms of one's current inclination and habit, without deference to any aspects of so behaving that might not "fit" in some sense. Play can occur only insofar as behaviors are sophisticated enough to show differentiation between the taking in aspect of behavior that bends reality to fit the self; and the self modifying aspects of behavior that bend the self to fit reality. Play can occur only insofar as there are many different modes of thought and action into which reality may be bent. Thus, it is that the newborn shows no play, and that until middle childhood more and more play is seen. Finally, play will not occur insofar as more adaptive responses become

familiar and can be easily invented when needed. Thus, it is that play is reduced in prominence in late childhood. (Gilmore, 1966, p. 318)

Cause and effects of play are sharply distinguished in Piaget's theory. There are two important products of play. The first is joy or pleasure or some closely related state. Play brings with it the "functional pleasure of use" which is readily apparent in the infant engaged in practice play. The second product of play is adaptive. Play facilitates the retention of new abilities. What may be lost through disuse is maintained as these new abilities get more attention than "reality."

Piaget has also provided a system for categorizing types of play behavior. Briefly, he has noted two categories which reduce unpleasantness for the child. The first category is "compensatory combinations." This behavior "improves" reality through distortion to fit more agreeably with the child's conceptualization. The second category is "liquidating combinations," in which behavior is freed from strong affect that initiated the play behavior. An example Piaget notes is of his daughter. After having been frightened by seeing a dead duck, the child played at imitating the dead duck and made her dolls see a dead duck without fear. This source of play is similar to psychoanalytic conceptualization of play.

A psychoanalytic concept of play was first introduced by Freud (1908, 1920, 1926) in regard to fantasy and repetition behaviors. Gilmore (1966) states that Freud thought of play as being closely related to fantasy behavior; in fact he defined play as fantasy woven around real objects (toys) as contrasted with pure fantasy, which is daydreaming.

Two classes of wishes were distinguished by Freud, either of which is necessary for play. The first category consists of the wishes of a child to be grown up or in a more fortunate position. The child fantasizes a condition he wishes to exist, in accordance with his tendency to seek immediate pleasure. Secondly, play arises from the tendency to repeat any experience which has been too much for him. In this the child wishes to take an active role in painful situations he experienced passively. Erikson clarifies this as follows:

Play often proves to be the infantile way of thinking over difficult experiences and of restoring a sense of mastery, comparable to the way in which we repeat, in ruminations and in endless talk, in daydreams and in dreams during sleep, experiences which have been too much for us. (Erikson, 1959, p. 85)

A "sense of mastery" is the most frequently cited effect of play in psychoanalytic theory. This mastery feeling is limited to play which reverses a painful experience. Purely wish fulfillment play is pleasurable through the

reduction of psychic tensions. Waelder (1933) pointed out that play can circumvent the action of the superego as well as reality. Play makes it possible to achieve what is physically or morally impossible.

There have been some modifications of psychoanalytic theory of play notable by Anna Freud (1936) and Erik Erikson (1937, 1940, 1950, 1951, 1959). Anna Freud suggests that play may serve a defensive purpose as well as promoting active coping behavior. In imitative play where the imitated object is feared, there is a lessening of the fear either of the object or what it represents. Erikson emphasizes the coping aspects of play (Gilmore, 1966). Erikson (1950) states, The human animal not only plays most and longest, it also remains ready to become deadly serious in the most irrational contexts. Gilmore (1966) notes that Erikson's concept of play disruption is perhaps his most important contribution to play theory. Anxiety leads to play but play can become stressful by mobilizing the anxiety it is trying to process. This results in an abrupt stop in play. Recently, Erikson (1977) has expanded play as a model for understanding the ritualization of human experience.

In summary, psychoanalytic theory emphasizes the adaptive aspects of play behavior motivated by intrapsychic dynamics of the individual. Freud discussed play behavior within the framework of wish fulfillment. Here reality is

modified to satisfy the drive to reduce conflict. A. Freud and Erikson further pointed out the adaptive aspects of mastery in play. Erikson (1950) states that there is mastery of reality through the creation of "model situations."

White (1959) has addressed mastery derived through play behavior which is not based in conflict.

White (1959) proposes that play behavior promotes a general relationship of effectiveness which the child seeks to maintain or to establish between himself and the environment. The control over animate and inanimate objects or situations, especially those which cannot be affected in reality, is the goal of "effectance." As the child matures, the gap between what others do and what the child accomplishes is reduced. Play is motivated by the ego-competence energy which is a drive for effectiveness. Play occurs because one feels inclined toward such behavior and finds it naturally satisfying (feeling of efficacy). White states

Young animals and children do not explore because of a desire to practice useful skills and prepare for future contingencies. They play and explore because it is fun, because there is something inherently satisfying about it, not because it is going to have a value in a future time. (White, 1964, p. 34)

Focusing on the more recent conceptualizations of play, Gilmore's (1966) second category, play is conceptualized as serving several functions in the child. Cognitive theorists have emphasized the necessity for play in cognitive

development. Psychoanalytic theorists have focused on its usefulness for intrapsychic development. White has suggested that the motivation for and utility of play is in a more general mastery over his world. Two recent theorists have also attempted to explicate the function of play behavior.

Two new themes in the area of play are Singer's (1973) conceptualization of imaginative play and Lieberman's (1964) construct of playfulness. Both of these authors are addressing common aspects of play behavior. Each has articulated constructs which provide new information and clarity regarding more specific aspects of behavior within the general framework of play. By examining their similarities, it may be possible to provide a more comprehensive understanding of play behavior.

Singer (1973) defines imaginative play as the introduction of an "as if" dimension to the individual's perception of his experience. This is a modification of the environment based on experience carried in memory with early imagery. He notes that various other theorists (Freud, 1929; Lewin, 1935; Luria, 1932) have noted this transformation, postulating that this quality is fantasy in the child and daydreaming in the adult. Singer further articulates this play behavior as play which requires a central generation of imagery and involves pretend elements, i.e. changing of voices and roles, changes in time and

space. This definition of play is consonant with many previously postulated theoretical conceptualizations of play (psychoanalytic: A. Freud, 1937; S. Freud, 1958, 1959; Erikson, 1950; Hartmann, 1958; Piaget, 1962; White, 1959, 1960, 1964).

Lieberman (1964, 1977) examines a core of personality traits which she labels playfulness which can be seen as an element in play, imagination, and creativity. She suggests that there is a developmental continuity of playfulness as a behavior and that playfulness survives play and becomes a personality trait of the individual. She notes that playfulness is made up of spontaneity, manifest joy and a sense of humor. Playfulness, then, can be seen in the perspective of a qualitative aspect of play. Lieberman's work is also consonant with previous play theorists (Huizinga, 1955; Piaget, 1932; White, 1959, 1960, 1964).

Each of these two theorists, Singer, and Lieberman, is examining play behavior in an effort to provide a theoretical unity incorporating the cognitive and affective dimensions of play. Singer (1966, 1973a) examines the play behavior with respect to the child and hypothesizes the implications of this play behavior with respect to personality development and cognitive processes. Lieberman, on the other hand, explores the personality trait of playfulness which is theoretically based around imagination and play behavior (Lieberman, 1977). By examining the relationship

between these constructs and the cognitive component of ideational fluency, it is hoped that this author may provide further codification of our understanding of play behavior and generate further unity within a comprehensive theory of play.

CHAPTER II  
IMAGINATIVE PLAY PREDISPOSITION, PLAYFULNESS, AND  
IDEATIONAL FLUENCY: THEORETICAL UNDERPINNINGS  
AND EXPERIMENTAL DATA BASE

The concept of imaginative play as defined by Singer (1973) provides a unity of various theories of play. Imaginative play is the ability to inject an "as if" or make-believe component in play. We can conceptualize this behavior as serving a variety of functions for the child. The use of imagination and fantasy provide the child with a tool to facilitate the organization of his world along both cognitive and affective dimensions. Psychoanalytic theorists have commented on the purpose of bending reality to meet the individual's needs. Cognitive theorists have articulated the process by which the child bends reality in order to organize his world cognitively.

Freud discussed fantasy behavior within the framework of wish fulfillment. Here reality is modified to satisfy the drive to reduce conflict. A. Freud and Erikson pointed out the adaptive aspects of mastery in play involving imaginative elements. Erikson (1950) points out that there is a mastery of reality through the creation of "model situations" (imaginary situations). Hartmann (1958) stated that fantasy is an autonomous ego function which is developed without conflict. This expands the psychoanalytic

conceptualization of play and fits well with Singer's conceptualization. Singer's (1966) construct of imaginative play describes the process necessary to reduce conflict (Freud) or to gain mastery (A. Freud, Erikson). Modification of reality by injecting an "as if" or make-believe component enables the child to reduce conflict. Singer (1966) is defining the mechanism necessary to accomplish the function of play in psychoanalytic theory; that of bending reality to reduce conflict.

Piaget's (1962) conceptualization of play as defined by the process of assimilation neatly supports Singer's theory. According to Piaget, play is not a behavior per se but a process. Play is the assimilation of reality to the ego. Play is distinguishable by a modification, varying in degree of the conditions of equilibrium between reality and the ego. The child utilizes assimilation in order to respond to his environment with the schemata available at a certain age. The introduction of make-believe elements aids in the maintenance of his perceptions at equilibrium or in balance with his world. Singer's (1966) construct of imaginative play is for the most part equivalent to Piaget's (1962) construct of symbolic play.

"Symbolic play, then, is only one form of thought linked to all others by its mechanism, but having as its sole aim satisfaction of the ego, i.e., individual truth as opposed to collective and impersonal truth ..." (Piaget, 1962, p. 167).

Millar (1968) interprets aspects of play within a cognitive framework as well. She hypothesizes that imaginative play is an aspect of cognitive feedback processes which enable the human to code and process incoming data. This is also stated by Schachtel (1959). In examining the repetitive aspects of play, he notes that this repetition provides the opportunity to integrate new information into a limited experience background. White (1960) expands on this theme of cognitive mastery into other areas of behavior.

White (1960) places the child's play behavior within the general developmental framework of striving for competence. The child utilizes play to expand his own capacities within the limits of his capacities. This includes social as well as, cognitive abilities. Tomkins (1962, 1963) expands the cognitive and affective components of play to note that it is utilized to organize the child's experience along both these dimensions. The peak of familiarity of material yields joy and laughter (Singer, 1966; Tomkins, 1962).

Singer's (1966) construct of imaginative play effectively provides a link between the affective and cognitive aspects of play behavior described in psychoanalytic and cognitive theories. It does so by providing the mechanism by which the affective needs articulated in psychoanalytic theory are accomplished and by describing the same mechanism which cognitive theorists have limited to information processing.

As White (1960) expands the function of play behavior into

the realm of competence, taking it beyond conflict reduction and cognitive processes, we can see that Singer's (1966) construct neatly provides the appropriate mechanism here as well. The child's affective development and cognitive development are limited by his age, i.e., he has limited intrapsychic structure and cognitive schemata for processing his world effectively. Imaginative play provides a mechanism for expanding his competence, given these limitations, to achieve mastery.

#### Relationship of Play to Psychopathology

Singer expands his theoretical work to postulate aspects of personality development. Corrigan (1960) states that daydreaming can be useful as a coping mechanism. The development of imagination and daydreaming may be associated with a pattern of development and personality organization. This personality organization is one in which thinking is valued and affective control and motor control are emphasized. Within this personality development Singer (1973) addresses the issues of pathological development. He suggests that the high fantasy oriented individual will develop a more obsessive defense pattern. The low fantasy individual, on the other hand, will develop a more hysterical style, where defenses are primarily repression and denial.

In essence Singer is proposing that those individuals who have a high imaginative play predisposition will then utilize this mechanism defensively to reduce conflict. Again it becomes clear that Singer is describing an internal process which describes one form of defense mechanism according to psychoanalytic theory. What he is proposing is that what psychoanalytic theory describes in children as play, wish fulfillment to reduce conflict, in adults is transformed into an internal obsessive defensive pattern. He goes one step further to propose that individuals with a high imaginative predisposition evidenced in childhood as high frequency imaginative play behavior, are more likely to utilize this process defensively thereby developing a more obsessive personality style.

#### Antecedents to Imaginative Play

Singer's (1973) first study of imaginative play predisposition explored several variables: background variables of the child and his relationship to his parents, waiting behavior, creativity and personality characteristics. Singer hypothesized that imaginative play viewed as a manifestation of cognitive and affective style might well be associated with a pattern of development and personality organization in which thinking is valued and affective and motor control would be more emphasized. Contact with at

least one benign adult and the opportunity to be alone were seen as necessary to increased imaginative play development. In addition, from the perspective of psychopathology, high fantasizers were expected to utilize defenses associated with obsessional characteristics, while low imaginative play children were expected to exhibit patterns more like those of hysterical personalities with less self-consciousness and greater use of the mechanisms of denial and repression. Singer examined forty children between the ages of 6 and 9 years, of middle SES backgrounds and of somewhat above average intelligence. The results supported several of the hypotheses and clearly pointed out differences between high and low imaginative play subjects. High imaginative play subjects reported greater associations between their parents and themselves, were able to wait for longer periods of time, had significantly higher ratings for creativity in a storytelling task and showed more obsessional defense mechanisms than low imaginative play subjects.

Pulaski (1973) examined the effects of toy structure on imaginative play. It was hypothesized that minimally structured materials would stimulate more imaginative play than highly structured materials. Subjects in this study were kindergarten, first and second graders. Again this sample was homogeneous: upper middle class children attending a private school. The results were quite interesting.

Minimally structured toys, for both low and high imaginative play subjects yielded a greater variety of themes in play than highly structured toys. High imaginative play children played at a higher fantasy level than low imaginative play subjects. High imaginative play children also became more deeply absorbed in their play than did low imaginative play subjects. High imaginative play children also appeared to be more pleased and interested in their play than low imaginative play subjects. In addition, high imaginative play subjects showed a tendency to integrate more than one category of toy in their play. High imaginative play subjects also showed greater flexibility in coping with demands upon their ability to produce fantasy. They also responded less negatively to interruptions in their play. Overall, it can be seen that there was a distinct difference between low and high imaginative play children from equally privileged situations and with equally high intelligence. High imaginative play children were more original, creative, flexible and well integrated.

Biblow (1973) examined drive reduction and mood change in the control of aggressive responses in high and low imaginative play subjects. Examining fifth grade white, middle class children of average intelligence, he found that high imaginative play subjects reduced aggression through the use of fantasy. Biblow concludes that the spectrum of his data supports that there are distinct differences between

high and low imaginative play subjects, both in behavioral aggression and in all mood states.

Freyburg (1973) examined the possibility of increasing imaginative play in urban disadvantaged kindergarteners. Utilizing a public school, she found that after one month of training, the experimental group improved significantly in its use of imaginative play, as well as, in the expression of positive affect and increased concentration in play. The control group remained unchanged. The changes in the experimental group continued post-training, and were tested during two months of post-training observations.

Gottlieb (1973) also explored the modifiability of imaginative play. Noting the decrease of overt manifestations of make-believe between the ages of 6 or 7 and 12, she chose to use two age groups as subjects: 10 to 12 and 12 1/2 to 14 years. She was interested in exploring the difference in fantasy behavior at the two age levels, and its modifiability given a high or low fantasy predisposition. She found that expression of fantasy was increased for young children with exposure to an adult model. Junior high school age subjects' responses were more directly related to their imaginative play predisposition, rather than modeling effects, i.e., they responded more in terms of their personality attributes. She concluded that imaginative behavior increases with age and as such it can be concluded that it is a skill that develops with

differentiation, that there are age trends in ability to engage in fantasy and in the content of fantasy as well.

The evidence for imaginative play predisposition supports that there are differences between low and high fantasy predisposed individuals, that there are overt behavioral and personality differences. The behaviors related to fantasy appear to be modifiable given different environment variables.

The above mentioned studies explore a variety of directions regarding imaginative play. It is important at this point to note, how if at all, they contribute to the theoretical basis of play behavior. Singer's (1973) study most directly explores theoretical concerns by addressing the defensive patterns utilized by the high and low imaginative play predisposed children. His finding that high imaginative play predisposed children utilize more obsessional defense mechanisms supports the hypothesis that this imaginative process may be related to the obsessional defense mechanism, which in turn leads to the development of an obsessional personality style. The other issues he addresses regarding parent-child relationships, waiting behavior and creativity do not directly address theoretical issues. Rather they provide information regarding behavior to which imaginative play predisposition may be related.

Pulaski's (1973) study focuses more on description of imaginative play in response to the stimulus of different

toys. This study describes differential behavioral responses to play materials rather than directly providing support for theoretical questions.

Biblow's (1973) study, in contrast to Pulaski's (1973) work, more directly explored theoretical issues. The cathartic theory of aggression from a psychoanalytic basis hypothesizes that fantasy operates to lower aggression. His data supported that hypothesis by establishing that high imaginative play subjects utilized fantasy to reduce aggression. This provides data regarding the utility of imaginative play as a mechanism to reduce conflict.

Freyburg (1973) and Gottlieb's (1973) works both examine the modifiability of imaginative play. Again as with Pulaski's work, these studies provide information regarding the parameters of imaginative play but little direct support for theoretical conceptualization. Studies in imaginative play to date have served two useful and complimentary functions: empirical support for certain aspects of theoretical conceptualizations and description of the parameters of imaginative play.

#### Relationship of Play Behavior and Playfulness

Singer (1973) and Lieberman (1977) have both addressed the tendency toward play in children. Singer (1973) suggests that the tendency to engage in imaginative play, fantasied role shifting or daydreaming may be looked upon as a

particular skill that can be developed in a given child as a consequence of the interaction between constitutional capacities with a particular set of early environmental circumstances that provide encouragement for practice. This tendency or trait in the individual has been addressed by Lieberman (1977) in her construct of playfulness.

Lieberman (1964, 1977) examines a core of personality traits which she labels playfulness. Playfulness can be seen as an element in play, imagination and creativity. She postulates that there is a developmental continuity of playfulness as a behavior and that playfulness survives play and becomes a personality trait of the individual. She notes that playfulness is made up of spontaneity, manifest joy and a sense of humor. Playfulness can be seen in the perspective of a qualitative aspect of play.

The theoretical underpinnings to Lieberman's (1964) work are less clear cut than Singer's work. Essentially, Lieberman's work attempts to address qualitative aspects of behavior rather than a discrete behavioral process that can be identified as evident or lacking. Playfulness is descriptive of the content of play behavior, as opposed to the structure of play, e.g., Singer (1973) imaginative play. Theoretically it is unclear what function playfulness serves. Playfulness is an expressive dimension of play behavior rather than a mechanism of play behavior.

Qualitative aspects of play have received less attention in the psychological investigation of play. Huizinga (1955) refers to the play spirit. Joy, fun, pretend, and nonseriousness are key words in his conceptualization of play. While the fun element is seen as the part of play that resists logical analysis, it is at the same time regarded as characterizing the essence of play. Perhaps to the extent that play behavior is more or less playful, i.e., has more or less spontaneity, joy and humor in it, it is more closely related to the quintessence of play.

How an individual child plays in relation to environment incorporates theoretically the playful component of play noted by Piaget (1932, 1962) and White (1960, 1964). This is the enjoyment or pleasurable component of play noted by Piaget (1962). White (1964) articulates this as fun, the inherent satisfaction of play behavior. This is a key aspect of how the clinician looks at play. It is the deviation from the play spirit which is important.

Moustakas (1955) reports on play therapy with normal children. He notes that these children are happy, often singing and humming, and in their actions they are both more decisive and spontaneous than disturbed children. Hartley, Frank, and Goldenson (1952) found in nursery-school children that well-adjusted children played as enthusiastically as the troubled youngsters, but their delight in toys was greater.

Developmental psychologists have also referred to the qualitative aspects of play. For example, Piaget (1962) distinguishes playful from imitative behavior and describes it as a process whereby the child incorporates external objects into his own thought schemata in a joyful manner. Hunt (1961) finds function pleasure in play as a quality that frequently accompanies learning as a result of aimless activity.

Playfulness emerged from observational studies of how children play (Lieberman, 1977). In an effort to examine theoretically complex behavior she defined operationally playfulness as physical, social, and cognitive spontaneity, manifest joy and sense of humor. Within the framework of play, it was seen as a quality of play. These operational definitions of the qualitative aspects of play represent the first step in providing an adequate empirical investigation of playfulness. It is readily apparent that the theoretical underpinnings for the construct are more sophisticated than the operational definitions based on loosely defined behavioral observations. The playfulness construct is an ambitious attempt to operationalize the expressive content of play behavior. Both psychoanalytic theory and cognitive theories have more directly addressed the functional and structural aspects of play behavior while alluding to the qualitative or expressive dimensions of this behavior. What Lieberman (1964) is attempting to

provide is a perspective of the content of play behavior: social, cognitive and affective. In light of this, however, this is the best methodological exploration to emerge out of the theoretical speculation.

Lieberman (1964, 1977) has examined playfulness at two age levels: kindergarteners and adolescents. The research on kindergarteners investigated the relationship between playfulness and divergent thinking. Utilizing middle-class children attending private kindergartens, she found that there was a unitary trait called playfulness composed of five dimensions: physical, cognitive, and social spontaneity, manifest joy and a sense of humor. The relationship between divergent thinking and playfulness was not so clear. But a clear relationship between playfulness and ideational fluency and spontaneous flexibility (two aspects of divergent thinking) was found. The strongest relationship was between ideational fluency and playfulness.

The adolescent study looked at high school students, noting that there is a resurgence of the joyful-spontaneity-sense of humor syndrome during adolescence and that this behavior syndrome is related to cognitive style (Lieberman, 1977). Preliminary results yield a more complex picture for adolescents than kindergarteners. It is not clear whether or not there is a "pure" playfulness factor for adolescents. The research was conducted in a classroom behavior of intellectual commitment which is not consonant

with the bubbling effervescence of playfulness. Some preliminary work is currently being done on a college age population.

From the work of Singer (1973) and others (Biblow, 1973; Freyburg, 1973; Gottlieb, 1973; Pulaski, 1973) there appears to be evidence for high and low imaginative play predisposed individuals. In addition, the work of Lieberman (1964) provides evidence for a playfulness trait in children. In order to further describe these behavioral traits it is necessary to expand the existing data base, i.e., to replicate the findings on a broader data base as well as explore the relationships between these traits.

The present study explores the relationships between imaginative play, playfulness, and ideational fluency. Ideational fluency was chosen as an effort to replicate Lieberman's (1964) findings and to provide further data as to the structure of the cognitive aspect of imaginative play.

Qualities frequently noted in children's play are its imaginative scope and creative power (Lieberman, 1964). There has been, however, little research done on young children in regard to this creativity. In their initial work on creative thinking in adults, Guilford et al. (1951) hypothesized eight abilities that might "discover the individual who is potentially creative." Among these eight was ideational fluency. This is the calling up of ideas in

situations demanding relatively little restriction, the difference in scores being more a function of the number of ideas produced than the quality, degree of appropriateness, or the aptness of expression of the ideas (Guilford, et al., 1956).

While Guilford was refining his factors looking at adults, Torrance (1960) and his associates used his conceptual framework and an adaptation of his tests to examine creative thinking in children. The Minnesota research team was able to develop batteries of nonverbal and verbal creative thinking tasks. One of the constructs which could be meaningfully scored was ideational fluency. The purpose behind these studies was to provide a description of and a means of testing creative potential.

The present study grew out of several considerations. There exists extensive and sophisticated theoretical formulations regarding play behavior. The empirical support for these theories is wide ranging, divergent, and methodologically poorly developed. Rather than develop new constructs and instruments to measure them, it seemed more useful to work with currently defined constructs which overlapped theoretically. Relationships between playfulness and imaginative play predisposition would provide information regarding both the structure and the content of play behavior. While recognizing the methodologies as first steps in operationalizing complex phenomena, working with these

methodologies to explore their utility is an appropriate investigation. If in fact the constructs address similar aspects of behavior, as their theoretical bases suggest, then establishing empirical relationships could provide new directions for empirical and theoretical work in play. The evidence for playfulness, imaginative play predisposition and ideational fluency has been limited to homogeneous samples: middle class urban children. In an effort to expand this data base it seemed desirable to replicate the data on a less homogeneous sample.

### Hypotheses

#### Hypotheses 1 and 2

Based on both psychoanalytic and cognitive theoretical conceptualizations of play behavior, Singer (1973) has operationally defined imaginative play behavior as an aspect of play behavior which encompasses the ability to inject an "as if" component into play. Utilizing the methodology developed by Singer (1973), as well as the Holtzman Inkblot Test. It is hypothesized that the evidence for high and low imaginative play predisposed individuals can be replicated on an heterogeneous SES sample of kindergarten and first grade children. It is further hypothesized that a more appropriate scoring technique for the Holtzman Inkblot Test utilizes Human plus Movement responses.

Hypothesis 3

Lieberman (1964) has operationally defined the construct playfulness to address the qualitative aspects of play behavior based on observations of children's behavior. Utilizing the methodology developed by Lieberman (1964), it is hypothesized that the evidence for a playfulness aspect of behavior can be replicated on a SES heterogeneous sample of kindergarten and first grade children.

Hypothesis 4

Ideational Fluency, developed by Guilford (1951) as an aspect of creative thinking in adults, was expanded on by Torrance (1960) to explore creative thinking in children. Utilizing Lieberman's (1964) methodology for kindergarten children, it is hypothesized that the evidence for ideational fluency can be replicated on an heterogeneous SES sample of kindergarten and first grade children.

Hypotheses 5 and 6

Given the theoretical overlap of imaginative play predisposition and playfulness it is hypothesized that these two constructs are highly related in kindergarten and first grade children. High imaginative play predisposed children likewise should demonstrate behavior rich in the quality dimension of playfulness. It is further hypothesized that the subcomponent of cognitive spontaneity in playfulness will have the greatest relationship to imaginative play predisposition, as it most directly examines imagination.

Hypothesis 7

In addition, it is hypothesized that ideational fluency is related to both playfulness and imaginative play predisposition in this sample of kindergarten and first grade children.

CHAPTER III  
METHODS OF PRESENT STUDY

Selection of the Population

The kindergarten-first grade classes of the P.K. Yonge Laboratory School of the University of Florida were selected for the study. Due to its relationship with the University of Florida the students are accustomed to a variety of interruptions in their normal school day whether it be for experimental purposes or special observers or visitors. It was felt, therefore, that there would be fewer effects introduced by the experimental intervention per se as this is seen as "normal" in this school. In addition, as the school selects its population to reflect five SES levels of the community and a heterogeneous population was desirable, the population was ideal.

There were four combined kindergarten-first grade classes. Arrangements were made with each of the four teachers to gain her cooperation and interest in the study. Essentially all the Caucasian students were utilized to provide a balanced sample for sex and SES level.

Subjects

Eighty kindergarten and first grade children attending the P.K. Yonge Laboratory School of the University of Florida were selected. There were 40 females and 40 males. One male child moved during the data collection period resulting in a total sample of 79, 40 female and 39 male. All subjects were Caucasian and participating in the regular class program.

The population attending P.K. Yonge School is drawn equally from five SES levels in a semi-urban population. The students are selected for P.I. Yonge Laboratory School to reflect both the ethnic and SES composition of the community. The five SES levels are as follows: Level I income--\$6,000, Level II--\$6,000 - \$10,499, Level III--\$10,500 - \$14,499, Level IV--\$15,000 - \$20,999, Level V--\$21,000+.

All subjects were of at least normal intelligence as measured by the Peabody Picture Vocabulary Test. The IQ range was from 91 - 162, with the mean IQ 113.

Procedure

Thursday or Friday of the week prior to the data collection the experimenter visited the classroom for the day. This enabled the experimenters to become more familiar with the classes' daily routine and physical layout. The experimenters consisted of two senior undergraduate psychology majors

in addition to the primary investigator. The primary investigator collected data from two classrooms, the other experimenters each collected data from one classroom.

Each of the four classrooms had one experimenter for the period of one week. Each subject accompanied the experimenter to a small workroom adjacent to the classroom for three separate testing sessions. Each session ranged from 15-30 minutes. Each of the three sessions comprised one aspect of the evaluation. The experimental condition was broken down into three sessions to accommodate the child's attention span. Session A consisted of the Peabody Picture Vocabulary Test; Session B consisted of the ideational fluency tasks and the Imaginative Play Predisposition Interview; Session C consisted of the Holtzman Inkblot Test. The experimental tasks were presented to the subject in a randomized sequence to account for order effects. All of the subjects in one classroom were processed in one week, except for circumstances of school absence. No two sets of evaluation instruments were administered in one day.

Concurrent with the experimenter's data collection from the students was data collection from the teachers. Initially the primary investigator met with the teachers to discuss the Playfulness Rating Scales, to explain the instructions and to answer any questions. A copy of the rating scale was left with the teachers. They were asked

to keep the rating scale in mind as they observed their students for 2 weeks. A second session with the experimenter was held to further discuss the rating scale and to answer questions. The teachers were then asked to rate the children.

#### Means of Evaluation

Evaluation instruments for this study covered three defined areas of inquiry: ideational fluency, playfulness and imaginative play predisposition. In addition, a standardized picture vocabulary test was used to estimate intelligence.

Ideational fluency was examined utilizing two tasks: (a) Product Improvement Task, and (b) The Monroe Language Classification Test. A description of the tests is as follows. The Product Improvement Task is a two part test. For Part I the subject was presented with a stuffed dog made of brown plush material, approximately 7 inches long. The dog had button eyes, a button black nose, a red tongue and a red ribbon around its neck. The following instructions were given:

Well, what have we here. It is a toy dog. Now you tell me the most interesting, cleverest ways by which you can change this dog (or: make him different) so that you and other children would have more fun playing with it. You just tell me how and I'll write down your ideas.

The subject's responses were recorded for 1 minute 30 seconds. For Part II the subject was presented with a cloth doll, McCall's Pattern #5724. The doll was approximately 11 inches long with brown yarn hair and a blue denim shirt and pants. The following instructions were given:

What else do we have here? It's a doll. Now you go ahead and tell me the most interesting and cleverest ways by which you can change this doll so that it will be more fun to play with.

The subject's responses were recorded for 1 minute 30 seconds. See Appendix A for the tasks.

The Monroe Language Classification Test was a three part test. The subject was given the following instructions: "Now this is the last thing we're going to do." "Tell me all the animals you can think of as quickly as you can." "Tell me all the things to eat you can think of." "Tell me all the toys you can think of." Responses for each category were recorded in a 1 minute 30 second time block. See Appendix A for the tasks.

The Product Improvement task and the Monroe Language Classification Test were developed and/or adapted by Lieberman (1964) in her work on divergent thinking in kindergarten children. Ideational fluency, an aspect of divergent thinking, was selected to be examined in this study as it yielded the results of greatest significance in her work. Lieberman (1964) utilized the following criteria for development of her instruments: (a) applicability of existing tests,

or of specially constructed tests modeled after existing tests, at the kindergarten level; (b) evidence for validity and reliability of these tests from a pilot study for her initial research project and from the existing literature.

Based on the work by Guilford (1951) and Torrance (1960) on creative thinking and Gewirtz (1948) and Meyers (1962) on verbal fluency in young children, Lieberman (1964) developed the following tasks: Product Improvement, Guilford's Plot Titles, and the Monroe Language Classification Test. From the Monroe Test the objects selected were Animals, Things to Eat, and Toys. The child was asked to list as many as he could think of. The tasks are included in Appendix A.

#### Validation and Reliability of the Tests

Lieberman's (1964) final selection of the tests was made after a pilot study with 14 subjects attending a private kindergarten in New York City. The age range was from 4-6 to 6-3 years, the average being 5-0 years. Meaningful scores were obtained for ideational fluency from all three tests. She noted that teacher conferences provided a preliminary validity check since the children who scored high on the divergent thinking factors were judged creative by the teachers.

Lieberman developed a special scoring guide for the ideational fluency tasks (1964). (See Appendix B.) As far

as possible, the rationale was modeled after existing tests by Torrance and Guilford. The introduction of the new product, namely the doll and the original text of the stories, called for specific guidelines for the answers obtained. Interscorer reliability for the divergent thinking scores was established in the Lieberman study on a sample of 20 records. The Pearson  $r$ 's were .99 for ideational fluency on all three tasks.

#### Data on Validity from the Literature

The evidence about the tasks measuring ideational fluency is as follows. (a) For Product Improvement Torrance (1960) claimed face validity and gave scoring categories on the basis of a sample of 146 elementary school children, grades 1-6. (b) Analysis of the Monroe Language Classification Test showed a factor loading of ideational fluency (Meyers et al., 1962) and comparable tests of object naming also showed loadings on ideational fluency (Bereiter, 1961; Guilford & Christensen, 1956).

#### Data on Reliability from the Literature

For the Product Improvement Task Torrance (1960) mentioned the interchangeability of a toy monkey with the toy dog and cited interscorer reliability in the .80's, hence the selection of a dog in Lieberman (1964). Meyers et al.

(1962) reported a reliability of .62 based on intercorrelations of the three parts for the Monroe Language Classification Test (Animals, Toys, Things to Eat).

#### The Playfulness Scale

Playfulness was evaluated utilizing the Playfulness Scale developed by Lieberman (1964). (See Appendix C.) This scale consists of five subscales corresponding to the five behavior traits of physical spontaneity, manifest joy, sense of humor, social spontaneity, and cognitive spontaneity. Each scale is divided into an A and B part, referring to the quantity and quality of the trait measured. These subdivisions were made in order not to contaminate frequency with degree or intensity of the trait measured. It was found that the further refinement was considered helpful to the raters (Lieberman, 1962). The division also indicated no prior assumption that quantity and quality were related. Ratings are made on a five point scale. Descriptive labels for the points on the scale are given, as are sample behavior items for each trait to be rated. The format of the scale was modeled after Beller's (1955) instrument for assessing dependence, independence and aggression in young children through teacher ratings (Lieberman, 1964). As a check on validity, Lieberman (1964) included two questions not related to the behavior indices for playfulness. These

scales asked for an evaluation of the child's intelligence and his physical attractiveness.

Reliability coefficients, obtained from the ratings of the two teachers for the five traits and considered qualitatively and quantitatively, ranged with a Spearman-Brown correction from .66 to .86 with a mean of .70 (Lieberman, 1964). Intercorrelations between the playfulness traits ranged from .61 between sense of humor and physical spontaneity to .86 between manifest joy and cognitive spontaneity (Lieberman, 1964). When centroid factors were extracted, four of the five playfulness traits (cognitive spontaneity, social spontaneity, manifest joy, sense of humor) had loadings in the middle .80's on the first factor. Physical spontaneity had a loading of .78. Factors 2 and 3 accounted for little of the variance with factor loadings ranging from .092 to .379. Lieberman (1964) concluded from this that Playfulness could be conceptualized as a unitary trait.

#### The Peabody Picture Vocabulary Test

This test is an individual intelligence test for ages 2 1/2 to 18 years. It is designed to provide a well standardized estimate of a subject's verbal intelligence (Dunn, 1965). This test was chosen for its ease of administration and previously noted appropriateness (Lieberman, 1964). As an instrument using verbal stimuli and nonverbal responses,

it aims at an assessment of verbal comprehension and learned information. It is, therefore, considered sufficiently different to provide some control measure for the scores on the ideational fluency tasks (Lieberman, 1964). Also testing time is short, which is an important consideration for use with kindergarteners.

The test consists of 150 plates. Each plate has four well drawn and unambiguous pictures from which the subject is asked to choose one response to the examiner's question. The subject need only point. The score is the number of correct answers. The manual suggests starting points for different age levels.

With respect to the difficulties experienced with measures of intelligence below age 6, the evidence cited for validity and reliability can be considered satisfactory. A correlation of .79 with the Wechsler Intelligence Scale for Children has been obtained for a group of above average elementary school children. Reliability coefficients are given by age level and are .73 and .67 for ages 5 and 6, respectively (Dunn, 1965).

#### Measuring Imaginative Play Predisposition

Singer (1973) notes that a major effort aimed at articulating more precisely what goes into imaginative tendencies in children and adults has grown out of the use of projective techniques. Projective techniques utilize the

the presentation of relatively ambiguous stimuli to individuals who are then required to tell stories about pictures or to give associations to abstract inkblots, etc. These ambiguous testing instruments were developed in an effort to provide behavioral assessment of underlying inclinations. Singer (1968) views projective techniques as a method to tap ongoing behavioral tendencies in the individual. The use of projective methods for studying imagination has generally involved what the content reveals about specific conflict areas, as can be seen from the widespread use of the Thematic Apperception Test or various forms of association tests (Singer, 1973). A different approach has developed using the Rorschach Inkblot Method. Rorschach (1942) provided a major insight by noting that the tendency to produce movement or color responses when looking at the inkblots tapped not so much the specific content of conflicts or needs, but rather measured a broad trend toward reliance on imagination or an open expression of emotionality as a major tendency (Singer, 1973). Rorschach proposed that all human experience could be measured along an introversion-extraversion dimension and that the ratio of the human movement (M) responses in inkblots to the color responses in producing associations was a fundamental way of tapping this predisposition (Rorschach, 1942). On the whole, there seems to be considerable support in research for at least some aspects of Rorschach's interpretation of the

human movement responses as a measure of imaginativeness in both children and adults (Singer, 1960, 1968, 1973). Singer (1973) links the development of the human movement (M) response to the internalization of speech in the form of heightened imagery and fantasy. This provides the basis for the choice of the inkblot method as one approach to estimating imaginative predisposition to play. Normative data with the original set of Rorschach inkblots indicate that children show relatively few such movement responses before the age of 6 or 7 (Ames et al., 1974). It was necessary, then, to find another technique appropriate to a younger population. The Holtzman Inkblot Test (Holtzman, 1961), however, provides useful norms on performance of children as young as 5 years. The data from the Holtzman Inkblots strongly support the importance of the movement response as an index of ideational tendencies (Singer, 1973).

The Holtzman Inkblots were developed in an attempt to provide a projective technique with psychometrically sound scoring procedures for responses to inkblots while also preserving the rich qualitative projective material of the Rorschach (Holtzman et al., 1961). The Holtzman Inkblots consist of 47 cards (45 are utilized in the score, 2 are practice cards). The subject is required to provide one response to each card. The cards are then scored, utilizing a standard format. Various studies have examined the comparability of the Holtzman Inkblot responses and the

Rorschach Inkblot responses. Most of the recognized Rorschach responses can be reproduced by configural scoring utilizing the basic elements coded in the Holtzman technique (Holtzman et al., 1961). Haggard, cited in Holtzman (Holtzman et al., 1961), utilizing multivariate analysis, found significant correlations across eight scores in the responses of high school students. Important to note is that the movement response was one of the eight scores examined. Holtzman et al. (1961) conclude that these results indicate quite conclusively that the Rorschach and Holtzman systems have a great deal in common as far as the underlying meaning of their respective variables is concerned. Holtzman et al. (1961) provide an equivalency table for converting movement (M) responses according to the Klopfer method of Rorschach scores as Holtzman Inkblot scores of  $M > 1$  plus  $H > 1$ .

Biblow (1973) utilized the Holtzman Inkblots to determine imaginative predisposition with fifth grade children. Utilizing the blots, fantasy level was determined upon the basis of the score for movement responses to 20 selected cards. Gottlieb (1973) also utilized the movement (M) score on one-half of the Holtzman Inkblots, Form A, with elementary school and junior high school age children, as an aspect of imaginative predisposition evaluation.

The movement (M) response on the Holtzman blots is scored for inanimate, as well as animate, movement. Rorschach (1942), however, stated that movement (M)

responses applied only to human or animal (animate) movement. In an effort to examine the introversive elements articulated by Rorschach as related to imagination in the individual, this study examines different combinations of scores of the Holtzman blots: M scores alone and  $M > 1$  plus  $H \geq 1$ .

The odd-numbered cards, Form A, of the Holtzman Ink-blots were used in this study. Odd-even reliability coefficients for the procedure were sufficient to utilize one-half of the instrument to allow for the kindergarteners' limited attention span. The correlation coefficients for each of the responses for the 5 year old population are as follows: Movement (M) .80, Human (H) .79.

Singer has developed an interview for assessing imaginative play predisposition (Singer, 1973). (See Appendix D.) He has noted that it is possible to get adequate data from children as young as kindergarten age. The questions are as follows: (a) What is your favorite game? What do you like to play the most? (b) What game do you like to play best when you are all alone? What do you like to do best when you are all alone? (c) Do you ever have pictures in your head? Do you ever see make-believe things with pictures in your mind or think about them? What sort of things? (d) Do you have a make-believe friend? Do you have an animal or toy or make-believe person you talk to

or take along with you? Did you ever have one, even though you don't any more?

The key in scoring these items has to do with the degree to which the child's report indicates the introduction of symbolic play or make-believe. The questionnaire was scored on a five point scale (range 0 - 4 positive imaginative responses). Singer (1973) notes that most children do not receive a score higher than 2 or 3. He concludes that scores of 0 - 1 indicate low imaginative play predisposition, while scores of 2 or more indicate high imaginative play predisposition.

## CHAPTER IV RESULTS AND DISCUSSION

### Inter-rater Reliability

The Peabody Picture Vocabulary Test was scored according to manual instructions, and the subjects received an IQ score.

The Monroe Language Classification Test was scored blind by three raters. Two raters were senior undergraduate psychology majors; one rater was a first year graduate student in clinical psychology. The raters participated in a training session with the primary investigator. The raters then independently rated all the protocols. Inter-rater reliability was established utilizing a Spearman Correlation Coefficient. For the Monroe Language Classification Test inter-rater reliability for the three raters was as follows:  $\underline{r} = .99$ ,  $\underline{r} = .97$ ,  $\underline{r} = .97$ .

The Imaginative Play Predisposition Interview responses were scored blind following the same procedures as described for the Monroe Language Classification Test. Inter-rater reliability was established utilizing the Spearman Correlation Coefficient. Inter-rater reliability for the Imaginative Play Predisposition Interview was as follows:  $\underline{r} = .80$ ,  $\underline{r} = .83$ ,  $\underline{r} = .82$ .

The Product Improvement Task was rated by two senior undergraduate psychology majors. The procedure for rating was described above for the Monroe Language Classification Test. Inter-rater reliability was established utilizing the Spearman Correlation Coefficient. The inter-rater reliability was r = .96.

The Holtzman Inkblot Tests were scored by three advanced graduate students in clinical psychology who had experience in administering and scoring projective tests and one less advanced graduate student in clinical psychology. Each rater participated in a training session with the primary investigator to learn how to score the Holtzman blots for human and movement responses. Each rater then scored approximately 20 protocols (one rater scored 19). The primary investigator served as a standard with which the raters' scores were compared for inter-rater reliability. Four of the protocols were randomly selected for comparison as follows. Each rater scored five protocols and one was randomly selected for comparison prior to completing the remaining protocols. The standard then independently rated the target protocol. Differences in scoring were discussed but the scoring was unchanged. This procedure was followed until all the protocols were completed. A Tau B was utilized for calculating inter-rater reliability. Reliabilities were as follows:

Rater 1	Human Responses	$\tau = .94$
	Movement Responses	$\tau = .86$
Rater 2	Human Responses	$\tau = .83$
	Movement Responses	$\tau = .99$
Rater 3	Human Responses	$\tau = .72$
	Movement Responses	$\tau = .90$
Rater 4	Human Responses	$\tau = .88$
	Movement Responses	$\tau = .93$

It was hypothesized that there would be significant relationships between imaginative play predisposition and playfulness, with the relationship between the subitem cognitive spontaneity and imaginative play predisposition as most notable. In fact, the only relationships of significance generated by the regression equations were between cognitive spontaneity and imaginative play predisposition. Imaginative play predisposition measured by the Singer interview plus Holtzman movement score was significant at the .005 level with the quantitative index for cognitive spontaneity. The slope of the regression was negative. Imaginative play predisposition as measured by the Singer interview plus Holtzman movement response was significant at the .05 level with the qualitative index for cognitive spontaneity. The slope of the regression was positive. Imaginative play predisposition as measured by the Singer interview plus the Holtzman movement plus human response was significantly related to the quantitative index for playfulness. The slope of the regression was negative.

There was no evidence for a significant relationship between ideational fluency and playfulness.

#### Hypotheses I and II

##### Measuring Imaginative Play Predisposition

With respect to the interview task designed by Singer, he suggests that frequency of high (2 or greater) and low (0 - 1) imaginative play predisposition would be evenly divided in a normal population. In this study the sample was divided approximately in half (38 high, 49 low) with the high imaginative play predisposition defined as a score of 2 or greater and the low imaginative play predisposition defined as a score of 0 or 1. (See Table 1 for distribution of scores.) Imaginative play predisposition was related to sex in this sample. Females scored higher than males ( $F \leq .01$ ).

Another question raised by this study was the appropriate scoring technique for the Holtzman Inkblot Test. Spearman Correlation Coefficient for the relationship between the movement responses alone and the combination human plus movement responses was  $r = .78$ , suggesting that at this age the responses are essentially the same. The relationship between the imaginative play predisposition and the Holtzman movement responses was  $r = .14$  and the imaginative play predisposition and Holtzman human plus movement responses

R = .22; neither relationship was significant. This lack of correlation suggests that the Imaginative Play Predisposition Interview and the Holtzman Inkblot Test may still be aspects of the complex phenomenon of imaginative play predisposition but are clearly not measuring the same components. For the purposes of this study both types of scoring were examined in a linear regression model to examine relationships between the Holtzman Inkblot score and the other variables. Both movement and movement plus human responses were positively related to age: imaginative play predisposition, movement alone:  $F \leq .01$ ; imaginative play predisposition, movement plus human response:  $F \leq .005$ . This would suggest that the older the child the higher the score on the Holtzman task. This would confirm developmental trends noted by Holtzman (cited in Hill, 1972). Others have suggested (Ames et al., 1974) that this developmental trend is evident in Rorschach movement (M) responses as well. This introspective aspect of development does perhaps develop over time. When the interview score and the Holtzman Inkblot score were combined it also reflected the relationship to age: imaginative play predisposition, Holtzman movement along/age:  $F \leq .005$ ; imaginative play predisposition, Holtzman movement plus human response/age:  $F \leq .001$ . This may suggest that the age effect in the Holtzman score is so strong that the combined imaginative play predisposition is age related. Imaginative Play Predisposition scores without

the Holtzman component were not age related. Singer (1966), however, suggests that this trait is not age related but rather is a quantifiable entity within an individual, which may show development over time but should not directly be affected by age. This raises some interesting questions. If indeed, as Singer suggests, there is an imaginative play predisposition and it can be measured by his interview task without age demonstrating a clear relationship then the utility of including the Holtzman measure with its strong relationship to age is questionable. It would seem that adding this measure, although hypothesized theoretically as a component of imaginative play predisposition, is so affected by developmental trends as to perhaps eliminate or confound the true imaginative play predisposition. On the other hand one could question whether or not this is an artifact of the age range examined. The frequency of movement (M) responses shows more marked change in these years than at other ages. In Holtzman's normative data cited in Hill (1972), 5 year olds at the 48th percentile generated a raw score of 9; first graders at the 50th percentile generated a raw score of 14. Norms on fourth graders reflected a raw score of 24 at the 50th percentile which was equivalent to percentile norms for the average adult population. This could indicate that the Holtzman Inkblot Test for a younger population is too heavily affected by developmental trends to serve as an adequate measure of imaginative play

predisposition for these early years. The Holtzman task, however, was selected as it seemed more appropriate than a Rorschach at these early years. A more suitable method of examining imaginative play predisposition needs to be developed for these early years.

### Hypothesis III

#### Measuring Playfulness

Lieberman's (1964) scale measures five separate aspects of playfulness on both a quality and quantity dimension. Each subdivision--physical spontaneity, manifest joy, social spontaneity, cognitive spontaneity--can receive a rating from 1 to 5 for each (quality, quantity). A child's combined quality of playfulness score, therefore, has the range of 5 - 25. A child's combined quantity of playfulness score has the range of 10 - 50 (quality + quantity). In this sample the playfulness scores did not distribute themselves adequately over the range to reflect both high and low playfulness scores. Over 50% (n=58) received scores of 36 or greater. As can be seen in Table 3 the sample reflected almost no children with low playfulness scores. When the scores were broken down by SES levels (see Table 4) it can be seen that this trend was evident in all SES levels.

The finding of high playfulness scores raises some interesting questions. Utilizing Lieberman's instrument it is evident that Lieberman's (1964) results were replicated.

As Lieberman's (1964) sample also reflected a high playfulness bias. The teachers were able, in rating the children, to utilize all five points on each of the subdivisions (some students did receive scores less than 3); however, the majority of students received scores of 3 or greater on all the subdivisions. Two of the teachers were able to utilize all five points on the Lieberman scale. The remaining two teachers utilized four out of the five points on the Lieberman scale. Tables 5-8 illustrate the four teachers' ratings. The playfulness rating scale requires further examination on more samples of children before playfulness as a construct can be further explored.

#### Hypothesis IV

##### Measuring Ideational Fluency

Scores were obtained in a distribution which ranged from low to high for ideational fluency. The point range, however, was so limited as to raise questions as to the utility of the methodology for further research. With a range of scores found in this population from 1 to 38, over 50% of the population ( $n=44$ ) scored in the middle range from the scores of 16 - 25. With a restricted scoring range of less than 40 points, a majority of scores within the range of 9 points makes it difficult to utilize the instruments as designed by Lieberman (1964). (See Table 9.) In order

to measure the construct of ideational fluency more effectively tasks need to be designed which better discriminate between the high and low dimensions of ideational fluency.

#### Hypothesis V, VI and VII

It was proposed that given the possibility of measuring the three constructs adequately (ideational fluency, imaginative play predisposition, playfulness) comparisons between scores on each of the three would yield significant relationships. It was suggested that high scores on playfulness would be related to high scores on imaginative play predisposition and ideational fluency. This was suggested given the theoretical underpinnings of the constructs. Due to the limited range of scores on the ideational fluency instruments and the difficulty in establishing any subjects in the low range of playfulness, regression functions generated few significant relationships between imaginative play predisposition, playfulness and ideational fluency.

In order to further examine the lack of significant relationships between imaginative play and playfulness, the top twenty imaginative play scores and the lowest twenty imaginative play scores were examined in relationship to their corresponding playfulness scores (See Table 10 and 11). It was hoped that by examining this subsample of the population some further information might be gained regarding the relationship between imaginative play and

playfulness. The score utilized to determine imaginative play was the combined interview and Holtzman movement plus human response. A low imaginative play response was defined as  $\leq 4$ ; a high imaginative play score was defined as  $\geq 17$ . Graphs were plotted comparing imaginative play to a total playfulness score, a combined playfulness quantity score, a combined playfulness quality score, as well as each of the ten components of the combined scores. There were no apparent differences in the distributions. In summary, the only significant relationships generated by the regression equations were between imaginative play predisposition and cognitive spontaneity.

### Discussion

Extensive theoretical work and research in play behavior in children has generated a vast and less than cohesive body of literature. Although play behavior has aroused the interest of many, there is neither a cohesive theory nor an adequate methodology to tackle this complex behavior in human children. One difficulty has been the fact that our theorizing has extended beyond adequate empirical data to support it. Another difficulty has been the diversity of approaches to the problem. Investigators have tended to follow their own isolated routes of inquiry without comparing their work. Rather than being able to compare and contrast constructs, new ones are formed. This study attempted

to provide empirical data to support two current constructs and theoretical perspectives within play behavior. Second, it attempted to compare two different approaches to play behavior in an effort to generate some unity in theoretical conceptualization.

The first task, that of providing empirical support to two current theoretical constructs in the current literature, met with variable outcome. Jerome Singer's (1973) work on imaginative play predisposition is a relatively recent contribution to theoretical conceptualization of the role of imaginative play behavior in the development of the individual. This study, by demonstrating that imaginative play predisposition can be measured utilizing Singer's interview technique in a SES heterogeneous population of kindergarten and first graders, yields greater validity to the construct as well as reliability for the instrument with this population. The questions raised regarding the utility of the Holtzman Inkblot Test with this population are equally important. Given the high relationship between age/developmental factors and the resultant Holtzman Inkblot scores, one is inclined to doubt the utility of the instrument for this population in studying imaginative play predisposition. Furthermore, if imaginative play predisposition is a quasi-personality

trait or an aspect of personality development as Singer postulates, then one is inclined to question the Holtzman Inkblot Test as an instrument for measurement as it is so effected by age.

A third question that should be raised is regarding the developmental course of the imaginative play predisposition. Is the development so rapid during these years that it is difficult to measure or is it truly a trait in the individual or only an artifact of age or development. A further question to be asked regarding methodology is that if the Holtzman Inkblot Test and the Imaginative Play Predisposition Interview are so poorly correlated can one task be substituted for the other in inquiries with older age children where the Imaginative Play Predisposition Interview is inappropriate. The above mentioned questions underscore several needs in this area. First of all, further work needs to explore the definition of the imaginative play predisposition in order to generate a more appropriate methodology to examine it. Second, work in defining imaginative play predisposition and its methodology must be examined over more populations to provide a firmer data base for the construct.

Although Lieberman's (1964) results regarding playfulness were essentially replicated, i.e., teachers rated children as discriminable and in the upper range of playfulness, it

is not possible to conclude anything from those data. Without establishing validity, other than face validity, and reliability of the construct, it is difficult to conclude what the playfulness scale actually measures. Playfulness as a construct is theoretically interesting and potentially useful. Intuitively it addresses many of the concerns raised regarding play behavior by incorporating cognitive, social and affective components. Before further empirical exploration is possible, however, considerable basic methodological research must take place in order to determine the validity and reliability of the construct. One research possibility would be to utilize trained observational data on children's play behavior with teachers' and/or other trained observers ratings with the playfulness rating scales. Establishment of adequate validity and reliability of the Playfulness scale would permit it to serve as an efficient research tool.

The second problem attempted in this study, to compare two aspects of play behavior in order to provide some unity of theoretical conceptualization, yielded significant relationships which are intriguing. In turn these results raise further questions. Given the limited utility of the Lieberman (1964) playfulness instrument caution must be used in interpreting the results. In light of this caution, however, the relationships of significance were found between imaginative play predisposition and the cognitive

spontaneity subset of playfulness. As the cognitive spontaneity dimension of playfulness most directly addresses imaginative play, this may in fact be the only aspect of playfulness which is related to Singer's (1973) imaginative play predisposition. Of interest, however, was the fact that the slope of the regressions for the relationship between frequency of cognitive spontaneity and imaginative play were negative, whereas the slope of the regression representing the relationship between the quality of cognitive spontaneity and imaginative play was positive. One might intuitively assume that the slopes would both be positive. The question on the Lieberman (1966) instrument for measuring the quality of cognitive spontaneity directly addresses the degree of imagination demonstrated by the child in expressive and dramatic play. These significant relationships indicate an important direction for further empirical investigation.

An enormously frustrating task for the individual interested in examining play behavior is the lack of an adequate methodology for research. Although fascinating, play behavior is complex. Theoretical conceptualization surrounding play is diverse and equally complex.

The limited significant results in this study raise three basic questions. The first question is whether or not measures of the constructs have any empirical relationship to each other. The theoretical bases of the constructs

point to a relationship which was only minimally supported by the data. The second question raised by the results of this study is whether or not the constructs as defined are adequate for further empirical work. The aforementioned question is a methodological concern. The evidence for reliability and validity of the instruments currently assumed to measure the constructs may be inadequate to make any clear statements regarding the existence of the phenomena. The third question raised regards the logical processes of research: the inductive process vs. the deductive process.

There are two opposing schools of thought concerning the most effective methods for integrating diverse data. The deductive school states that theories should be formulated first and then tested by experiment. The inductive method is to experiment first and to let the theories emerge from the data. The difference between the two schools is not so much the presence or absence of theory in research, but the way in which theory is developed.

The deductive method provides a certain elegance in research by which comprehensive theories generate the definition of constructs. These constructs are then operationally defined and reliable and valid instruments are developed to measure observable behavior. Data are gathered in an effort to empirically support the theoretical postulates. The difficulty in this logical process is exemplified by the area of play. Theoretical development has far surpassed

methodological development. In psychology where phenomena are diverse and complex this presents a serious dilemma. The current trend in psychological research is to narrow one's focus to examine a small amount of relatively simple data.

A second approach in current psychological research is to utilize the inductive method. Sidman states: intensive cultivation of an area of research by an alert observer will inevitably bring out interrelations among the phenomena comprising the area (Sidman, 1960, p. 15). In this method a large number of experiments must be conducted with the hypothesis that order will emerge. This requires a basic faith in the orderliness of behavior.

The present research most closely followed the deductive method. Based on theoretical conceptualizations, relationships between the constructs of imaginative play predisposition, playfulness and ideational fluency were hypothesized. Conclusions from the data are limited by the absence of careful methodological development. This can be seen in the lack of clear operational definitions of the constructs, and the absence of reliable and valid instruments to measure observable behavior.

The course for future research can be guided by lessons from both the inductive and deductive methods of research. Inductively more observational data need be collected to generate the definition of play behavior and its

parameters. Deductively, the definitions of play behavior need to be tested empirically in relationship to the extensive theoretical literature existing regarding play. Research should establish the reliability and validity of the instruments presumed to measure behavior related to the constructs of imaginative play and playfulness. This could be accomplished utilizing careful observational data on children's play behavior.

Investigation of children's play behavior offers the researcher the potential for greater understanding of development: affective, cognitive, social and psychopathological. It is not surprising that play has captured the interest of philosophers, sociologists, anthropologists, as well as psychologists. As with so many areas in psychology, theoretical work reaches far beyond the data base. Each empirical investigation provides a few small steps to close that gap. Often of greater importance are the new questions which are raised. This study although providing few answers, clearly points to some important directions for future research.

TABLE 1  
DISTRIBUTION OF IMAGINATIVE PLAY PREDISPOSITION  
INVENTORY (SINGER) FREQUENCY OVER SES LEVELS

Imaginative Play Predisposition Interview Score	SES Level				
	I	II	III	IV	V
0	1 <sup>*</sup> (.07) <sup>**</sup>	3 (.19)	2 (.13)	3 (.19)	3 (.17)
1	4 (.29)	7 (.44)	6 (.40)	5 (.31)	7 (.39)
2	5 (.36)	4 (.25)	4 (.27)	5 (.31)	4 (.22)
3	3 (.21)	1 (.06)	3 (.20)	1 (.06)	3 (.17)
4	1 (.07)	1 (.06)	0	2 (.13)	1 (.06)

<sup>\*</sup>Number of subjects.

<sup>\*\*</sup>Percentage of N for each SES level.

TABLE 2  
 DISTRIBUTION OF COMBINED IMAGINATIVE PLAY PREDISPOSITION  
 AND HOLTZMAN INKBLOT TEST SCORES OVER SES LEVELS

Combined Score	SES Level				
	I	II	III	IV	V
0 - 5	5 * (.36) **	3 (.19)	4 (.27)	4 (.25)	9 (.50)
6 - 10	4 (.29)	5 (.31)	5 (.33)	2 (.13)	3 (.17)
11 - 15	0	4 (.25)	2 (.13)	3 (.19)	3 (.17)
16 - 20	4 (.29)	2 (.13)	3 (.20)	4 (.25)	1 (.056)
≥ 21	1 (.07)	2 (.13)	1 (.07)	2 (.13)	2 (.11)

\* Number of subjects.

\*\* Percentage of N for SES level.

TABLE 3  
PLAYFULNESS SCORE FREQUENCIES

1 - 5	0
6 - 10	0
11 - 15	1
16 - 20	2
21 - 25	3
26 - 30	9
31 - 35	6
36 - 40	25
41 - 45	26
46 - 50	7

TABLE 4  
DISTRIBUTION OF PLAYFULNESS OVER SES LEVEL

Playfulness Score	SES Level				
	I	II	III	IV	V
1 - 5	0	0	0	0	0
6 - 10	0	0	0	0	0
11 - 15	0	1	0	1	0
16 - 20	0	0	1	0	1
21 - 25	1	1	0	0	1
26 - 30	1	2	2	1	4
31 - 35	1	0	2	2	2
36 - 40	4	4	7	5	4
41 - 45	4	6	2	6	6
46 - 50	3	2	1	1	0

TABLE 5  
TEACHER B PLAYFULNESS RATINGS

Subject Number	Physical Spontaneity Quantity	Physical Spontaneity Quality	Joy Quantity	Joy Quality	Humor Quantity	Humor Quality	Social Spontaneity Quantity	Social Spontaneity Quality	Cognitive Spontaneity Quantity	Cognitive Spontaneity Quality
1	5	4	5	5	4	5	5	5	5	5
2	4	4	5	4	4	4	3	4	4	4
3	4	4	5	4	4	4	5	5	4	4
4	3	3	3	4	4	3	3	4	5	3
5	5	3	5	5	4	3	3	2	4	4
6	5	4	5	4	5	5	4	3	3	3
7	5	4	5	5	5	4	5	3	5	4
8	4	4	5	4	4	4	3	4	3	3
9	3	3	5	4	5	4	3	3	4	4
10	4	4	5	4	3	3	4	4	3	4
11	5	4	5	5	4	3	5	4	5	5
12	5	5	4	4	4	3	4	3	5	5
13	4	4	4	4	5	5	4	3	4	5
14	5	5	4	5	4	4	5	5	5	5
15	4	4	5	4	4	4	4	5	4	5
16	3	4	5	5	4	3	4	4	5	5
17	5	4	4	5	5	5	5	5	5	5
18	3	2	3	3	3	3	3	3	3	4
19	4	3	5	4	4	4	4	5	4	4
20	4	3	4	3	3	4	4	5	4	5

TABLE 6  
TEACHER A PLAYFULNESS RATINGS

TABLE 7  
TEACHER C PLAYFULNESS RATINGS

Subject Number	Physical Spontaneity Quantity	Physical Spontaneity Quality	Joy Quantity	Joy Quality	Humor Quantity	Humor Quality	Social Spontaneity Quantity	Social Spontaneity Quality	Cognitive Spontaneity Quantity	Cognitive Spontaneity Quality
41	3	5	3	2	4	3	3	2	2	2
42	3	2	5	5	4	2	5	5	4	4
43	4	3	3	4	3	2	2	2	4	4
45	3	3	3	3	3	3	2	2	3	2
46	1	4	1	1	1	1	1	1	1	1
47	4	2	5	5	5	5	4	4	5	5
48	4	2	5	5	4	4	4	4	4	4
49	3	2	3	3	3	2	3	2	2	2
50	3	3	3	2	3	3	3	2	3	4
51	1	5	3	2	3	3	3	2	3	3
52	4	4	5	5	3	3	2	3	4	4
53	4	5	5	5	4	3	4	5	5	5
54	3	3	4	4	3	3	4	4	4	4
55	1	2	1	1	4	4	2	1	1	3
56	5	1	5	5	5	5	5	5	5	5
57	5	1	5	4	5	5	4	4	5	5
58	1	2	2	2	2	2	2	1	3	2
59	1	1	3	1	3	2	2	1	4	4
60	5	5	5	5	3	3	4	4	5	5

TABLE 8  
TEACHER D PLAYFULNESS RATINGS

Subject Number	Physical Spontaneity Quantity	Physical Spontaneity Quality	Joy Quantity	Joy Quality	Humor Quantity	Humor Quality	Social Spontaneity Quantity	Social Spontaneity Quality	Cognitive Spontaneity Quantity	Cognitive Spontaneity Quality
61	5	5	4	4	4	4	5	5	3	3
62	5	4	5	5	4	3	4	3	4	5
63	4	3	5	5	4	3	5	5	4	4
64	5	5	5	5	5	5	4	3	4	3
65	5	5	5	5	4	4	3	3	4	4
66	5	4	5	4	5	5	5	5	4	5
67	5	3	4	4	5	4	3	3	4	4
68	5	4	5	5	4	3	4	4	4	4
69	4	2	5	3	3	3	3	3	4	3
70	4	4	5	5	4	4	3	3	4	3
71	4	3	5	5	5	5	5	3	5	5
72	4	3	5	5	4	3	3	2	5	4
73	5	5	4	3	3	2	5	5	5	5
74	4	4	5	5	3	3	2	2	4	4
75	5	4	3	3	4	2	1	1	4	4
76	5	4	5	5	3	3	4	4	3	3
77	5	4	5	5	5	5	4	3	3	4
78	5	5	3	4	3	2	5	5	3	2
79	3	3	4	5	3	3	2	2	4	4
80	4	2	3	4	4	3	2	4	4	4

TABLE 9  
DISTRIBUTION OF IDEATIONAL FLUENCY SCORES OVER SES LEVELS

Ideational Fluency Score	SES Level				
	I	II	III	IV	V
10	0	0	1	2	1
11	1	0	0	1	0
12	0	1	0	0	0
13	0	0	0	0	1
14	0	0	0	0	0
15	1	1	0	0	1
16	0	2	1	3	2
17	0	0	1	0	0
18	1	1	0	0	0
19	2	0	1	1	3
20	2	1	2	1	0
21	1	1	0	1	1
22	1	0	3	1	0
23	0	1	1	1	1
24	1	0	1	0	1
25	1	1	1	1	1
26	0	1	0	0	0
27	1	0	1	1	1
28	2	2	0	0	1

TABLE 9 (continued)

Ideational Fluency Score	SES Level				
	I	II	III	IV	V
29	0	1	0	1	3
30	0	2	2	3	2
15	2* (.14) **	2 (.13)	1 (.07)	3 (.19)	3 (.17)
16 - 25	9 (.64)	7 (.44)	11 (.73)	9 (.60)	9 (.50)
$\geq 26$	3 (.21)	6 (.38)	3 (.20)	5 (.33)	7 (.39)

\*Ideational Fluency scores.

\*\*Percentage scores.

TABLE 10  
LOW IMAGINATIVE PLAY PREDISPOSITION SUBJECTS:  
PLAYFULNESS AND IMAGINATIVE PLAY PREDISPOSITION SCORES

TABLE 10 (continued)

Subject Number	Playfulness Scores	Imaginative Play predisposition Scores
47	2	Human Interview Plus Predictive Play Interview Predictive Movement
48	4	Human Interview Plus Predictive Play Interview Predictive Movement
49	3	Human Interview Plus Predictive Play Interview Predictive Movement
53	4	Human Interview Plus Predictive Play Interview Predictive Movement
59	1	Human Interview Plus Predictive Play Interview Predictive Movement
63	4	Human Interview Plus Predictive Play Interview Predictive Movement
65	5	Human Interview Plus Predictive Play Interview Predictive Movement
66	5	Human Interview Plus Predictive Play Interview Predictive Movement
68	5	Human Interview Plus Predictive Play Interview Predictive Movement

TABLE 11  
HIGH IMAGINATIVE PLAY PREDISPOSITION SUBJECTS:  
PLAYFULNESS AND IMAGINATIVE PLAY PREDISPOSITION SCORES

Subject Number	Playfulness Scores	Imaginative Play Scores
1	5 4 5 5 5 5 5 5 5 5	48 24 24 28.33 29.33 2.33
5	5 3 5 5 4 3 3 2 4 4	38 21 17 11 18 3.0
6	5 4 5 4 5 4 3 3 5 5	42 22 19 17.66 2.66
12	5 5 4 4 4 3 4 3 5 5	42 20 18 19 3
14	5 5 4 5 4 4 5 4 5 4	23 24 14.66 17.66 .6
15	4 4 5 4 4 4 5 4 5 4	43 21 22 21 24 3
16	3 4 5 5 4 4 3 4 5 5	42 21 21 37 29 4
17	5 4 4 5 5 5 5 5 5 5	48 24 22 31 24 3
21	4 3 4 4 5 5 5 4 5 5	44 21 23 16 17 2
33	2 2 4 4 5 5 5 4 4 4	38 19 19 16.66 17.66 1.66
37	3 4 5 5 2 2 4 3 4 4	36 18 18 23 20 1
42	3 2 5 5 4 2 5 4 4 4	39 21 18 22 17 3

TABLE 11 (continued)

Subject Number	Playfulness Scores	Imaginative Play Predisposition Scores
50	3 3 2 3 3 3 2 3 4	29 15 14 13.66 17.66 .66
51	1 5 3 2 3 3 3 2 3	35 27 0
55	1 2 1 1 4 4 2 1 1	15 35 27
60	5 5 5 3 3 4 4 5 5	39 21 11.33 18.33 3.33
67	5 3 4 4 5 4 3 3 4	39 21 18 21.33 18.33 1.33
73	5 5 4 3 3 2 5 5 5	39 20 19 20 20 24 1
76	5 4 5 5 3 3 4 4 3	43 22 21 42.3 44.3 2
77	5 4 5 5 5 5 4 3 3	43 22 21 42.3 44.3 1.3

APPENDIX A  
IDEATIONAL FLUENCY TASKS: INTERVIEW SCHEDULE

Introduction

"I have some things here to do and I'd like you to help me with them. I want to find out how boys and girls do these things, and whether they have fun doing them. So, I'm going to ask you and (mention playmates where indicated) to do these with me."

Product Improvement (after E. Paul Torrance)

1. "Well, what have we here. It is a toy dog. Now you tell me the most interesting, cleverest ways by which you can change this dog (or: make him different) so that you and other children would have more fun playing with it. You just tell me how and I'll write down your ideas."

Record answers and comments on form.

Time: 1'30"

If subject obviously runs out of responses, note time and go on to Part 2.

If subject can give no responses, skip Part 2 and go on to next item.

Only where subject is obviously shy, say: "All right, let's leave this for a while and maybe you'll think of something later." Return at end of battery.

2. "What else do we have here? It's a doll. Now you go ahead and tell me the most interesting and cleverest ways by which you can change this doll so that it will be more fun to play with."

Proceed as above.

Time: 1'30"

Monroe Language Classification Test (after C.E. Meyers et al.)

"Now this is the last thing we're going to do."

"Tell me all the animals you can think of as quickly as you can."

"Tell me all the things to eat you can think of."

"Tell me all the toys you can think of."

Record each category.

Time: 30" for each (extension to 1' considered). Praise child for cooperation.

"How did you like the things we did?"

Record answers.

APPENDIX B  
IDEATIONAL FLUENCY TASKS: GUIDE FOR SCORING

This guide is divided into two parts according to the two tasks: (1) Product Improvement and (s) the Monroe Language Classification Test.

While specific instructions for relevancy and scoring of responses are given separately for each task on the basis of the answers obtained in this study, the following overall guidelines for the divergent thinking factors of ideational fluency, spontaneous flexibility, and originality are applicable.

Ideational Fluency. This is obtained by counting all of the separate relevant responses given by subjects regardless of quality.

Product Improvement

Relevancy of a Response

1. The response must indicate that the instructions have been understood, i.e., something needs to be done to or with the object, resulting in a change in object or situation around it. Examples:

Relevant

Make him into a fox  
 Make him dance  
 (If he) barked a little  
 like alive  
 Add another doll to make  
 him brothers

Irrelevant

You can play with him  
 Share him  
 Squeeze his hand  
 To keep it the way it is  
 Key back here (without  
 follow-up)

2. The response must indicate that the child accepts the premise of change for the purpose stated, i.e., "fun to play with" and that it connects in some way with the given object. Answers indicating unrelated associational stream or pure nonsense--i.e., change to anything at all, are not acceptable. Examples:

Relevant

Make ears stand up  
 Make tail wag  
 Put bow in his head  
 Change into rabbit (for dog)  
 Change into doctor (for doll)

Irrelevant

Paper to write on or change  
 into nothing  
 Make into telephone  
 Turn into table

3. A reply may be relevant for toy dog but not for toy doll and vice versa. Also, in Part 2 (doll) change to stimulus object of 1 is not acceptable. Examples:

Relevant

Make him into a lion (dog)  
 Make him into a dolly (dog)

Irrelevant

Make him into a lion (doll)  
 Make him into a dog (doll)

4. An answer is relevant, irrespective of underlying affect, if outcome is judged constructive. Examples:

Relevant

Cut off head and use the out-  
 side (clothing) to make  
 a toy watch  
 Poke holes in his eyes  
 I'll twist his leg

Irrelevant

I'll break his head, arms,  
 everything  
 I'll cut off his ears  
 Take out his eyes

5. When by explicit statement or by implication, the dog or toy-man has been made alive ("adaptation" in Torrance's categories for flexibility), the following answers are relevant:

He might chase a cat  
Make him go to work  
To do things on a ship (in a number of instances subjects called doll "a sailor")

6. Part of a reply may be accepted as relevant. Example:

Play with it--wrestle or (put him on his head)

6. If a child by demonstration, acting out or story-telling makes changes implicit, the reply is relevant.

Examples:

"Woof, woof" as subject handles dog  
"Give him a house for children to have more fun playing, and ask the postman to fix him"

#### Scoring of Relevant Responses

When scoring for ideational fluency, the unit of enumeration is the thought unit, this coinciding with the classification unit. Therefore,

#### score as one (1)

1. When unit is logically connected and stated as such by subject. Examples: Take off shirt and change into different costume; take this ribbon off and put furry thing around him.

2. When the second part of the unit is an explanation of the first. Examples: Make him like Robin Hood--jump up and down; barked a little, like alive.

3. When the second part is an alternative. Example:  
Change his face with a mask or skin or an animal.

4. When after an overall change has been suggested, specific changes are detailed. Example: Change into col- lie--different fur, white and brown, back all brown, long mouth, sharp claws.

5. When changes are distinct but make up one context or classification unit, i.e., one idea. Example: To get a funny black and white clothes, brown hands, white nose, black eyes, and a funny green hat.

score as zero (0)

1. When only agents of change are given without specifying any changes. Examples: Make abracadabra; key back there; a fairy could change it.

2. When change back is specified. Example: Change into real pig, goose, and then change back to normal.

Monroe Language Classification Test

Relevancy of a Response

Animals--real, imaginary, living, extinct, and generic.

Examples:

<u>Relevant</u>	<u>Irrelevant</u>
Cow	Houses
Dinosaur	People

Things to Eat--everything edible, including general categories and fluids as well as food specified for animals.

Examples:

<u>Relevant</u>	<u>Irrelevant</u>
Lamb chops	Everything you can buy in
Meat	a store
Grill	Animals
Peanuts	
Milk	

Toys--a. All specific toys. Examples:

<u>Relevant</u>	<u>Irrelevant</u>
Dolls	Doll corner
Dump truck	Baby toys
Games	

b. Objects that are prefaced by "toy" or by the subject saying "one could play with" or that are implicitly understood to be handled in play situation. Examples:

<u>Relevant</u>
Clock
Mustache
People (in the form of dolls)
Telephone

c. Materials for play activities. Examples:

<u>Relevant</u>
Clay
Wood to make toys

d. Responses with no bearing on play situation are to be considered irrelevant. Examples:

Bees and bats
Closet Toy
Daphne (Name of playmate)

#### Scoring of Relevant Responses: Ideational Fluency

Animals. No credit for duplicate responses. Count separately male and female of species, and generic and

specific responses. Examples: Lion, Father Lion; fish, tunafish.

Things to Eat. a. Count separately when subject specifies different kinds of the same food. Examples: plain cheese, velveeta cheese. b. Count as single response when one dish or meal is implied. Examples: Spaghetti and meatballs, hamburger and french fries, supper, breakfast.

Toys. a. Collective terms are counted as single responses. Example: games. b. Mere elaboration without differentiation is a single response. Examples: car, automobile car. c. Count as separate responses when subject specifies differences in the same toy. Examples: baby dolls, big dolls; trucks, gasoline trucks.

APPENDIX C  
PLAYFULNESS SCALE

Rating Instructions

As a teacher you know that children differ in many ways--some are shy, some are friendly, some grab what they want, others ask, or wait, for it.

In this study, we are interested in finding out how children differ in the way they go about their play activities--how spontaneous, how cheerful, how "full-of-the-devil" they are, and we hope to have your cooperation in this work.

Attached you will find, therefore, a rating measure made up of five scales which refer directly to a child's behavior during play. You will note that each of the five scales or questions has two parts. Part A of the question aims to get at the frequency or quantity of the trait; Part B tries to assess the quality of the trait shown. For example, "how often does the child show joy" would be the quantity of the trait, and "with what freedom of expression" would be the quality of the trait.

We hope you will find it possible and worthwhile to look at the children in your group along the traits

suggested in the rating scales and give us your evaluation of them.

We are also interested in finding out what your impression is of the child's intelligence and physical attractiveness, and we would like you to give us your estimate of these as well.

When you rate the children, you will, of course, want to compare them with one another as well as keep in mind a general standard for these traits in kindergarteners.

It is easier and better to rate all children first on one trait (or question), and then do the same for each of the six other questions. The sheets for marking down your ratings have, therefore, been set up for the different traits.

There will be twelve ratings for each child. Please put down the figure that best indicates your evaluation of the child's present thinking. Descriptive terms are also given to help you in making your rating.

Any comments about the content or form of the questions, or about any difficulties that you may have in answering them, will be welcomed.

Playfulness Rating Scale

I. A. How often does the child engage in spontaneous physical movement and activity during play?

This behavior would include skipping, hopping, jumping, and other rhythmic movements of the whole body or parts of the body like arms, legs or head, which could be judged as a fairly clear indication of exuberance.

Very Often	Often	Occasionally	Rarely	Very Rarely
------------	-------	--------------	--------	-------------

5	4	3	2	1
---	---	---	---	---

B. How is his motor coordination during physical activity?

Excellent	Very Good	Good	Fair	Poor
-----------	-----------	------	------	------

5	4	3	2	1
---	---	---	---	---

II. A. How often does the child show joy in or during his play activities?

This may be judged by facial expression such as smiling, by verbal expressions such as saying "I like this," or "This is fun," or by more indirect vocalizing such as singing as an accompaniment of the activity, f.i., "choo, choo, train, go along." Other behavioral indicators would be repetition of activity, or resumption of activity with clear evidence of enjoyment.

Very Often	Often	Occasionally	Rarely	Very Rarely
------------	-------	--------------	--------	-------------

5	4	3	2	1
---	---	---	---	---

B. With what freedom of expression does he show his joy?

This may be judged by the intensity of loudness of a chuckle or a sing-song as well as the child's ability to repeat or resume his activity by his own choice.

Very High	High	Moderate	Some	Little
5	4	3	2	1

III. A. How often does the child show a sense of humor during play?

Very Often	Often	Occasionally	Rarely	Very Rarely
5	4	3	2	1

B. With what degree of consistency is humor shown?

Very High	High	Moderate	Some	Little
5	4	3	2	1

IV. A. While playing, how often does the child show flexibility in his interaction with the surrounding group structure?

This may be judged by the child joining different groups at any one play period and becoming part of them and their play activity, and by being able to move in and out of these groups by his own choice or by suggestion from the group members without aggressive intent on their part.

Very Often	Often	Occasionally	Rarely	Very Rarely
---------------	-------	--------------	--------	----------------

5	4	3	2	1
---	---	---	---	---

B. With what degree of ease does the child move?

This may be judged by ready acceptance of the new situation, lack of distress shown over the change, including an ability also to amuse himself if left solitary after peer interaction.

Very High	High	Moderate	Some	Little
--------------	------	----------	------	--------

5	4	3	2	1
---	---	---	---	---

V. A. How often does the child show spontaneity during expressive and dramatic play?

Instances of such behavior would be labeling the play products in clay, sand or paints as they grow, and/or changing them as a result of, f.i., a personal whim, an accidental shape, or a suggestion from the peer group; similarly, in a dramatic play, a labeling of play roles as the group structure develops and changes, f.i., extending or shrinking a "family" as playmates come and go.

Very Often	Often	Occasionally	Rarely	Very Rarely
---------------	-------	--------------	--------	----------------

5	4	3	2	1
---	---	---	---	---

B. What degree of imagination does the child show in his expressive and dramatic play?

Instances of imagination would be labeling and using animate or inanimate objects for other than the accepted usage as well as incorporating non-existent objects into the play situation.

Very High	High	Moderate	Some	Very Low
5	4	3	2	1

VI. How bright is the child?

This is your estimate of the child's intelligence based on observed behavior or inferred potential.

Extremely Bright	Bright	Average	Moderately Bright	Not too Bright
5	4	3	2	1

VII. How attractive is the child?

This is your evaluation of the child's physical appeal.

Very Beautiful	Nice- Attractive	Looks and Appearance	Passable in and unat- tractive	Somewhat homely
5	4	3	2	1

APPENDIX D  
IMAGINATIVE PLAY PREDISPOSITION INTERVIEW

Instructions for Interview

This is a semistructured interview. Begin by making a few pleasant remarks to the child and by identifying yourself by name. Then proceed to ask each question initially as written on the sheet. Repeat the question if you do not appear to be understood. If the child replies too tersely, ask him a question such as "Tell me just how you play it?" or "How do you do it?" If the child's answer is at once clear, there is no need to pursue the question. For example, if a child answers Question 1 by saying "blocks," we need to know whether the emphasis is on sheer construction or whether there's a "make-believe" component. A game like "marbles" or "ball" needs little further elaboration as it probably does not have a fantasy element. Write down the child's answer verbatim and also note if a further question was asked by writing (q) before the child's reply.

Do not be discouraged if you get relatively brief answers from such young children. This is to be expected; in examining protocols we find that we are getting sufficient material for rating purposes.

Imaginative Play Interview ScheduleImaginative Play Questions

1. What is your favorite game? What do you like to play the most? (Write verbatim answer. Query if not enough information to score.)
2. What game do you like to play best when you're all alone? What do you like to do best when you're all alone? Do you ever think things up?
3. Do you ever have pictures in your head? Do you ever see make-believe things or pictures in your mind and think about them? What sort of things?
4. Do you have a make-believe friend? Do you have an animal or toy or make-believe person you talk to or take along places with you?

APPENDIX E  
HOLTZMAN SCORING GUIDELINES

Movement (M)

The scoring of Movement is linked closely to content in most traditional systems for the Rorschach. Too frequently such practices lead to arbitrary conventions as to whether or not movement is scored or how it is scored. The resulting score is often highly confusing from a psychometric point of view. The essential characteristic of the movement response is the energy level or dynamic quality of it, rather than the particular content. Leaning heavily upon Zubin et al., (1953), Sells et al., (1952), and Wilson, (1952), a 5-point scale was adopted as follows:

- 0 - no movement or static potential for movement
- 1 - static potential for movement as indicated by such participles as sitting, looking, resting, lying
- 2 - casual movement, such as walking, talking, climbing, reaching
- 3 - dynamic movement, such as lifting, dancing, running, weeping
- 4 - violent movement, such as whirling, exploding

Credit for Movement is given only when the subject voluntarily ascribes movement or potential for movement to the percept. Direct inquiry to elicit movement should never be made by the examiner. The meaning of potential for movement

may need further explanation. Since Movement is designed to reflect the degree of movement, tension, or dynamic energy projected into the percept by the subject, it is important that concepts clearly involving tension and dynamic energy not be excluded merely because they may not be perceived in actual motion. The potential for movement is indicated by the stance ("a lion ready to spring") or the "looking-alive" quality as described by the subject. In some cases, the state of tension may be quite high even though visible motion as such is minimal. For example, in the response, "two men struggling in a tug of war," the energy level is sufficiently high to merit a score of 3 on Movement, even though the men may appear relatively motionless. It is always the level of energy invested in the percept by the subject which is scored rather than the degree of motion per se. The kinds of movement listed above to illustrate the different levels on the scale are in no way exhaustive; rather they serve to anchor the points on the scale. In scoring a given response, the particular way in which the percept is elaborated and described may occasionally require minor shifting up or down the scale to an adjacent category.

The total score on Movement is obtained by summing individual ratings across the 45 inkblots. Movement can range theoretically from 0 to 180, although in practice, it rarely rises above 80.

Content Scores: Human, Animal,  
Anatomy, Sex, Abstract

The scaling of content presents some difficulties because of its intrinsically qualitative nature. Inkblot responses can be classified into any number of categories according to variations in content. A single response may contain several such content categories. For research purposes a general, two-digit coding system is described elsewhere and need not be discussed further here. It is irrelevant to the variables treated quantitatively in the Holtzman Inkblot Technique.

Several aspects of content occur with high enough frequency, or are of sufficient interest in their own right, to justify scaling efforts. Human and animal responses are important to record, both in order to produce such classical Rorschach scores as M and FM by configural scoring of Movement and content, and in order to test hypotheses of interest concerning the nature of the human and animal responses. Similarly, anatomical responses, sex references and abstractions are singled out for special attention. It is quite likely that other aspects of content may prove worthy of scaling in the future.

For each of these five content scores, a 3-point weighting system has been adopted, permitting a theoretical range of total score from 0 to 90. These content variables differ somewhat in psychometric characteristics from most of the

others because it is very difficult for a person to obtain for a single response a score of 1 or 2 on all five variables. The definition of each variable is presented below, together with appropriate numerical weights.

Human (H)

Score 0. No human being or parts of a human being present in the response.

Score 1. Parts of human beings, featureless wholes or distorted bodies, and mythological or cartoon characters.

Score 2. Any whole human being whose parts can be differentiated. (Small parts such as a hand or foot can be missing.) The human face if elaborated. Parts of a human being, provided the subject assumes the remainder of the person to be present but hidden.

Difficulty in scoring occasionally arises due to an incomplete, undifferentiated response by the subject. For example, it is impossible to tell whether the subject is referring to animal or human (or simply creature) when he gives a response such as, "an open mouth," or "a face." In most such instances, he means a human mouth or a human face; however, this assumption should not be made without supporting evidence from other more detailed responses by the same subject. When there is genuine doubt, a score of 1 can be given to both Human and Animal. Animals engaged in activity which is strictly human in nature should also be scored 1 on Human and 1 or 2 on Animal. It should be emphasized

that all five content variables have been defined independently of each other so that a given response may get credit for more than one content score. The following examples illustrate the scoring of content.

<u>Response</u>	Score on Variable				
	H	A	At	Sx	Ab
Two creatures looking down, in mental struggle. They have a lot of tentacles.	1	1	0	0	1
This looks like a face to me.	1	1	0	0	0
Bunch of monkeys playing baseball.	1	2	0	0	0
This looks like a chest cavity ... the rib cage.	0	0	1	0	0
Big black bug crawling up a leaf.	0	1	0	0	0
Two centaurs.	1	1	0	0	0
An open mouth.	1	1	0	0	0
A snake.	0	2	0	0	0
A man walking through life with temptation next to him, leading him into sin.	2	0	0	0	1
Face of a monster.	1	1	0	0	0
Two dogs having intercourse.	0	2	0	2	0
Breast with a pink nipple.	1	0	0	2	0
X-ray of a woman's hips and pelvic region.	1	0	1	1	0
Woman's pelvis.	0	0	1	0	0
Skull of a horse.	0	1	1	0	0
A carnival ... bright colors suggest gaiety.	0	0	0	0	2

<u>Response</u>	Score on Variable				
	H	A	At	Sx	Ab
Lungs of a dog.	0	0	2	0	0
Two men running. You can see their insides.	2	0	2	0	0
Bacteria.	0	0	0	0	0

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the Degree of Doctor of Philosophy.

Jacquelin Goldman  
Jacquelin Goldman, Chairperson  
Professor of Psychology and  
Clinical Psychology

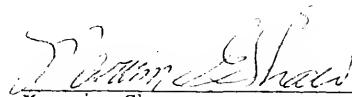
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the Degree of Doctor of Philosophy.

Paul Satz  
Paul Satz  
Professor of Psychology and  
Clinical Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the Degree of Doctor of Philosophy.

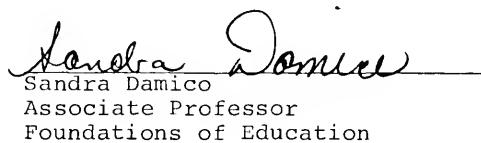
Benjamin Barger  
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the Degree of Doctor of Philosophy.



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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the Degree of Doctor of Philosophy.



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